

Appl. No. 10/712,829
Amdt. dated April 30, 2007
Reply to Office Action of March 21, 2007

Remarks/Arguments

Reconsideration of this application is respectfully requested.

Claims 1-20 are pending in the application.

Claims 1-20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Wettling et al. (U.S. Patent Publication No. 2003/0162918) in view of Ishikawa et al. (U.S. Patent No. 3,567,795).

Wettling et al. disclose a process for the preparation of polyisobutylenes by cationic polymerization of isobutylene or isobutylene-containing hydrocarbon streams in the liquid phase in the presence of boron trifluoride acting as catalyst, the catalytic activity of boron trifluoride being partially or completely stopped by means of a solid deactivator following a given timelapse, which deactivator is an inorganic, anhydrous or hydrous oxygen compound of aluminum which is insoluble in the reaction mixture.

Ishikawa et al. disclose a process of refining hydrocarbon polymers obtained by liquid phase polymerization with a Friedel-Crafts catalyst, wherein the polymer solution, containing catalyst, is contacted with an aqueous solution of a water-soluble salt selected from the group consisting of nitrates, sulfates, thiosulfates, phosphates, oxalates and silicates, reportedly making it possible to eliminate the catalyst as a decomposition product.

The Examiner has stated:

"With respect to claim 1, Wettling discloses a process for catalyst deactivation of a crude polyolefin polymerized in the presence of a boron trifluoride catalyst whereby the crude polyolefin is washed with water (see Wettling, page 4,

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paragraph 62), the aqueous and organic phases are separated (see Wettling, page 4, paragraph 62), an aluminum oxide adsorbent (deactivator) is added to the organic phase to form a slurry (see Wettling, page 4, paragraph 54), the slurry is heated (see Wettling, page 5, paragraph 75), and the adsorbent is separated from the organic phase (see Wettling, page 5, paragraph 75)."

With regard to the Examiner's statement that it is disclosed on page 5, paragraph 75 that the slurry is heated, it is submitted that this statement, while being strictly true, is inapposite for showing the process of the present invention to be obvious. The language referred to reads:

"The deactivator was placed in a sealable, pressure-resistant sampling glass. A sample of 50 mL was added at -15° C. with vigorous mixing within a few seconds and stirring was continued at this temperature over a period of 30 minutes. The mixture was heated to +20° C. in the sealed sampling glass during the following 60 minutes with stirring by a magnetic agitator."

The claims of the present application require the step of heating the slurry under *reduced* pressure at a temperature of at least about 180° C for at least about thirty minutes. It is submitted that letting a mixture stand at -15° C for thirty minutes and then heating to +20° C over a sixty minute period in a sealed tube would not suggest to the person of ordinary skill

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in the art the required step of the present invention. Not only is the highest disclosed temperature 160 degrees below the minimum required temperature of the present invention, but heating in a *sealed* sampling glass would bring about *increased*, not reduced, pressure. Thus, step D of the currently claimed invention is not disclosed or suggested by Wettling et al. Indeed, the Examiner has acknowledged, "Wettling does not disclose a process step for heating the slurry solution under reduced pressure."

Further, Wettling discloses only oxides of aluminum, water, alcohols, amines, caustic soda solutions, and aqueous ammonia as deactivators and makes no mention of the water insoluble silicates, i.e. magnesium silicate, calcium silicate, and aluminum silicate, required by claims 10-20 of the present application.

In an effort to overcome the deficiencies of Wettling et al., the Examiner has cited Ishikawa et al., saying that in column 5, at lines 16-18, it is disclosed that sodium silicate is brought into contact with a crude polymer solution and heated under conditions of reduced pressure.

First, the use of sodium silicate is outside the scope of the present claimed invention. As required by Ishikawa et al., a *water soluble* salt, e.g., sodium silicate, must be used, see column 2, lines 29-32. The silicates claimed for use in the present invention are calcium silicate, magnesium silicate, and aluminum silicate, *none of which are water-soluble*. Those skilled in the art know that the only water-soluble silicates are those of alkali metals. Thus, Ishikawa et al. fail to disclose or suggest the adsorbents of the present invention.

Second, with regard to the heating step of Ishikawa et al., the temperature only goes up to 100° C, rather than the minimum required 180° C of the present invention.

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Third, step E, the separation step, of the present invention takes place *after the step of heating* the slurry under reduced pressure, i.e. step D. Ishikawa et al., to the contrary, carry out their heating step *after the step of separating the clay adsorbent*.

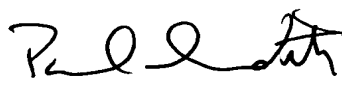
Thus, Ishikawa et al. does not teach:

- (1) the use of the adsorbents of the present invention;
- (2) the heating step of the present invention, i.e., at least 180° C; or
- (3) the step of separating the adsorbent after a heating step.

It is therefore requested that the rejection of claims 1-10 under 35 U.S.C. 103(a) as being unpatentable over Wettling et al. in view of Ishikawa et al. be withdrawn.

In view of the foregoing, it is submitted that this application is in condition for allowance and an early Office Action to that end is earnestly solicited.

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